



**HOT, COLD, WET OR DRY, GRAPHALLOY®  
BEARINGS WORK WHEN OTHERS FAIL.**



## GRAPHALLOY® Upgrade Saves Boiler Feed Pump

***Keeping a multistage boiler feed pump operating was a problem for a gas plant...until they installed GRAPHALLOY bushings and wear rings.***

A large industrial gas supplier in the southeastern United States experienced a catastrophic failure of a horizontal 8-stage, axially split, BB3-type multistage pump in Boiler Feed Service. The pump had been fitted with a plastic composite (Teflon®/Carbon Fiber) material for the stationary wear rings and bushings.

They contacted Graphite Metallizing and invited one of our engineers to visit their repair shop to examine the failed pump and recommend a GRAPHALLOY upgrade.



Here is what he saw: the throttle bushing showed the most wear. The sleeve under the throttle bushing was worn with radial grooves that appeared to be from contact with the stationary (plastic composite) wear part. However, in this case, the center stage (typically the first part to fail in a dry run episode or low viscosity transient) was fine while all of the hub side composite inserts were missing and the eye side inserts were unaffected. This tells us that we were looking at a completely different issue.

The engineers agreed that the cross section of the throttle bushing was so thin (only approximately 3/16 inch per side) and the pressure against the face of the bushing was so high that it deformed the plastic composite material causing it to move toward the ID.

The reduced clearance caused the bushing to ride onto the throttle sleeve. The friction and pressure caused the plastic composite material to melt and “blow out” the low pressure side. Once the throttle bushing was lost, the rotor lost its hydraulic balance within the case causing the rotor to shuttle towards the one end. The axial movement separated the mechanical seal faces and overloaded the bearing causing the pump to shut itself down. There was evidence the seal had leaked and the bearings showed signs of having thrust in one direction.

The Graphite Metallizing engineer recommended replacing the hub rings, center and throttle bushings, and eye side rings with nickel-grade GRAPHALLOY.

The GRAPHALLOY material was ordered, shipped next day, installed and the pump was quickly put back into service. The pump has been in service now for over four years with no further problems.